

MAKAROV, V.M.

It is now up to the technicians of the Ural Chemical Machinery Plant. Bum.prom. 36 no.3:10-11 Mr '61. (MIRA 14:4)

1. Glavnyy konstruktor Ural'skogo zavoda khimicheskogo mashinostroyeniya.

(Sverdlovsk---Paper industry---Equipment and supplies)

MAKAROV, V.M.

Furnaces and apparatus for chemical industries. Biul.tekh.-ekon.  
inform. no.10:18-21 '61. (MIRA 14:10)  
(Chemical industries--Equipment and supplies)

SHAPIRO, M.B., inzh.; MAKAROV, V.M., inzh.

Induction hardening of the pinions of low module reducing gears.  
Trudy NIIKHIMMASH no.34:26-32 '60. (MIRA 14:1)  
(Gearing)

81875

S/129/60/000/08/002/009

E073/E135

Martensitic Transformation, Mechanical Properties and Structure of  
Stainless Steels of the Austenite-Martensite Class

It was found that the best mechanical properties are obtained for steels containing 35-40% aged martensite and 60-65% austenite. These are obtained by quenching to produce an austenitic structure and subsequent treatment at sub-zero temperatures and ageing. Quenching from lower temperatures, of about 800 °C, will yield a similar martensite to austenite ratio but the carbides which are rejected along the grain boundaries reduce the ductility and the impact strength of the material. The structure of the steel was investigated by magnetic measurements and also by means of an electron microscope. In Fig 9 microstructure photos (X 5000) are reproduced for material which was quenched from 975 °C, and also for material quenched from 750 °C. There are 9 figures, 2 tables and 8 references (Soviet and 3 English).

Card 3/3

4

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S/129/60/000/08/002/009

E073/E135

Martensitic Transformation, Mechanical Properties and Structure of  
Stainless Steels of the Austenite-Martensite Class

structure should remain an austenitic one and that the transformation should occur only in the case of under-cooling to sub-zero temperatures, the initial heating temperature should be about 975 °C. In this case under-cooling to -70 °C is not enough and for full martensitic transformation temperatures as low as -100 to -120 °C are required. After quenching from temperatures above 950 °C the  $M_{1n}$  point is located at below zero temperatures and the structure of the steel will be an austenitic one (possibly with a certain quantity of  $\epsilon$ -martensite). As regards the influence of the speed of cooling, the results obtained for this steel are in agreement with the influence observed in earlier work (Ref 4) on the steel Kh12F1<sup>6</sup> (1.5% C, 12% Cr, 1% V). Rapid cooling in the martensite range suppresses martensitic transformation during cooling but intensifies the transformation under isothermal conditions and during heating. The data on the results obtained from the various heat treatments are entered in Table 1. The influence of various heat treatments on the mechanical properties was also investigated and the results are entered in Table 2 and plotted in Figs 6 and 7.

Card 2/3

*MAKAROV, V. M.*

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18.1130

S/129/60/000/08/002/009

EO73/E135

AUTHORS: Gulyayev, A.P. (Doctor of Technical Sciences, Professor, and Makarov, V.M. (Engineer)

TITLE: Martensitic Transformation, Mechanical Properties and Structure of Stainless Steels of the Austenite-Martensite Class

PERIODICAL: Metallovedeniye i termicheskaya obrabotka metallov, 1960, No 8, pp 3-9 (+ 1 plate)

TEXT: The steels of this type which are most widely used in the U.S.S.R. are: the steel Kh17N7Yu, which corresponds to the American steel 17-7-PH, and the steel Kh15N9Yu (EI904 or SN2). The authors of this paper investigated the steel Kh15N9Yu, which has the following composition: 0.07% C; 14.9% Cr; 8.9% Ni; 1% Al. The kinetics of martensitic transformation were studied by means of the anisometric method. It was found that after quenching from 800 °C the maximum temperature of the Min point equalled 80 °C, and the maximum quantity of martensite was 30% in the case of cooling to 20 °C and 70% in the case of cooling to -70 to -80 °C. If it is desired that after quenching the

Card 1/3

*X*

## 2045/1232

Механизация и автоматизация машиностроительного производства, станков и автоматов в машиностроительной промышленности. 1979. № 9. С. 12, 000 стр. 12, 000 стр. 12, 000 стр.

[illegible]

The American people are entitled to know the truth about the activities of the American Communist Party, its agents, and its methods. The American people are entitled to know the truth about the activities of the American Communist Party, its agents, and its methods. The American people are entitled to know the truth about the activities of the American Communist Party, its agents, and its methods.

0807/3432

- INVESTMENT IN FOREIGN CRY CRYSTALS, INC.

2. Mechanization and Automation of Control Devices for Operating Parts After Machining (Ignaty, A. V., and S. A. Rykova, Engineers)

- Inspection by Means of Eddy Currents (Podigin, N. M., Candidates of Technical Sciences, and L. Ia. Korobeynikov, Engineer):  
Eddy current method

- |     |  |
|-----|--|
| 163 | Selection of frequency of the power supply                       |
| 163 | Quality inspection   |
| 163 |  |
| 166 | Magnetic Method of Quality Inspection (Solodovnik, V. I. Moscow) |

- Barthens inspection of cast-iron parts

- ECONOMIC EFFECTIVENESS OF MECHANIZATION AND AUTOMATION (Definitively, -  
Dr. E., Candidate of Economic Sciences, V. M. Malozov, Engineer, and  
- F. L. Andreyev, Engineer.)

ATLANTA: Library of Congress

MAKAROV, V.M., inzh.; LAKHTIN, A.A., kand. tekhn. nauk; LOVTSKIY, E.V., inzh.

Possibility of the use of lenticular expansion joints at high pressures. Khim. mash. 3 no.3:26-29 My-Je '59.

(Pipe joints)

(MIRA 12:12)



APPROVED FOR RELEASE: 06/23/11: CIA-RDP86-00513R001031500040-6

SHAPIRO, M.B. , inzh.; MAKAROV, V.M., inzh.

Increasing the durability of compressor valve plates. Sbor.  
st. NIIKHIMMASH no. 23:96-104 '57. (MIRA 12:5)  
(Steel--Heat treatment)  
(Valves)

MAKAROV, V. M. Cand Tech Sci -- "Certain <sup>methods of the</sup> agricultural engineering <sup>process for</sup> ~~methods of~~ <sup>and</sup> ~~sowing annual cereals under~~ green fodder under conditions of the semi-desert zone of Akhtyubinskaya Oblast." Alma-Ata, 1961 (Min of Higher and Secondary Specialized Education <sup>KaSSR.</sup> ~~Ministry of~~ Kazakh State Agr Inst). (KL, 4-61, 204)

Country : USSR  
Category: Cultivated Plants. Fodders.

M

Abs Jour: RZhBiol., No 11, 1958, No 48993

Author : Makarov, V.M.  
Inst : Sci. Res. Inst. of Fodder and Pasturage  
Title : Aftermath quality of Perennial Grasses under the  
Conditions of Acid Steppe of Aktyubinskaya Oblast

Orig Pub: Tr. n.-i. in-ta kormov i pastbishch, 1957, 1,  
212-217

Abstract: The two-year experiments of the Aktyubin Experimental Station on preparatory mowing of Sudan grass and Chinese sugar cane at a low height showed that with this method it is feasible to make the plants vegetate for a long period and increase the reserves

Card : 1/2

M-89

MAKAROV, V.L.

Asymptotic behavior of the solutions to linear dynamic models  
of economic systems with discrete time. Dokl. AN SSSR 165  
no.4:767-769 D '65. (MIRA 18:12)

1. Institut matematiki Sibirskogo otdeleniya AN SSSR.  
Submitted April 10, 1965.

ACCESSION NR: AP4012347

transformed. Examples of Turing machines with all five of these limitations are given. It is pointed out that the performance of a Turing machine in which the tape can move in one direction only is equivalent to the performance of an operator realizable in a finite automaton. The connection between Turing machines and finite automata is discussed. The primary conclusion is that: for an arbitrary, partially-recursive function it is possible to construct a primitive-recursive operator, without anticipatory properties, which realizes a transformation which is in some sense equivalent to the transformation which is realized for the given partially-recursive function. "The author is indebted to B.A. Trakhtenbrot for his criticism and assistance." Orig. art. has: numerous formulas.

ASSOCIATION: none.

SUBMITTED: 31Aug62

DATE ACQ: 26Feb64

ENCL: 00

SUB CODE: DP, MA

NO REF SOV: 001

OTHER: 001

Card

2/2

ACCESSION NR: AP4012347

S/0199/64/005/001/0102/0108

AUTHOR: Makarov, V. L.

TITLE: Turing machines and finite automata

SOURCE: Sibirskiy matematicheskiy zhurnal, v. 5, no. 1, 1964, 102-108

TOPIC TAGS: automation, finite automation, turing machine

ABSTRACT: A study of Turing machines revealed that the following limitations do not reduce the class of transformations or mappings which is realizable with the general Turing machine: (1) The work of machine  $M^{(1)}$  begins with a survey of the first nonempty letter of a word recorded on the tape. (2) The machine  $M^{(2)}$  is not applicable to an empty word and when a coherent word is being processed a noncoherent word cannot appear on the tape of the machine (a word  $P$  is called coherent if it contains no empty symbols  $e$ ). (3) The machine  $M^{(3)}$  (with limitations 1 and 2) works in such a way that: (a) The tape cannot change its direction of motion unless the recording head prints the empty letter  $e$ ; (b) The machine stops only when the head is at the end of a word and is printing the symbol  $e$ . (4) When the tape motion of the machine  $M^{(4)}$  is to the right no changes in the processed word can take place. (5) The recording head of machine  $M^{(5)}$  is in the same state  $q_0$  at the beginning of each step, i. e., when the first nonempty letter of a word recorded on tape is being

Card 1/2

MAKAROV, V.L., inzh.; STARCHIKOV, A.V., inzh.

Mechanization of loading and unloading operations in the  
extraction of wall blocks. Mekh.stroi. 19 no.12:10-11 D '62.  
(MIRA 15:12)

(Loading and unloading) (Crimea--Building stones)

LEYKIN, M.G., kand.tekhn.nauk; MAKAROV, V.L., inzh.; BRYANOV, V.V., inzh.

The economic basis of the efficient capacity of sawed stone  
quarries. Stroi. mat. 8 no.8:21-23 Ag '62. (MIRA 15:9)  
(Quarries and quarrying)



LEYKIN, M.G.; MAKAROV, V.L.

Mechanizing the extraction and loading of building stone. Mekh.  
stroi. 18 no. 3:16-17 Mr '61. (MIRA 14:5)

1. Krymskiy filial NIISMII.  
(Building stones--Transportation)

STARCHIKOV, A.V., inzh.; MAKAROV, V.L., inzh.

Stone-handling machine designed by Krivorutchenko. Stroi. mat. 6  
no.12:23-24 D '60. (MIRA 13:11)  
(Quarries and quarrying--Equipment and supplies)

LEYKIN, M.G., inzh.; MAKAROV, V.L., inzh.; MESHMAN, A. N., inzh.

Performance testing of the SM-580A stonecutting machine. Stroi.  
1 dor. mashinostr. 5 no.4:26-27 Ap '60. (MIRA 13:9)  
(Quarries and quarrying--Equipment and supplies)

MAKAROV, L.L.

Condition of equilibrium in the Nagmann model. Sib.mat.zhur.  
3 no.3:476-478 My-Je '62. (MIRA 15:9)  
(Economics, Mathematical)

MAKAROV, V.L., master; SALTUKOV, V.V.

Maintaining motors in operation during short term disappearance  
of voltage in the net. Energetik 8 no.1:16-18 Ja '60.  
(MIRA 13:5)

(Electric circuit breakers) (Electric motors)

ZHIDKOV, V.A.; MAKAROV, V.K.

More about single roller bits. Neft. khcz. 42 no. 11:56-60 N '64  
(MIRA 18:2)

MAKAROV, V.K.

Basis for progress in the knit goods industry. Tekst.prom.  
21 no.3:5-9 Mr '61. (MIRA 14:3)

1. Zamestitel' nachal'nika Upravleniya po avtomatizatsii i obrudovaniyu dlya legkoy promyshlennosti Gosudarstvennogo komiteta Soveta Ministrov SSSR po avtomatizatsii i mashinostroyeniyu.  
(Knit goods industry)

## Instruments and Installations for Investigating (Cont.) SOV/3089

TsNIIIV, TsNII MASHdetal', and the TsNIIshelka scientific research institutes; the Zavod imeni Karla Marksa (Plant imeni Karl Marx), Kolomenskiy zavod (Kolomenskoye Plant), Orlovskiy zavod (Orel Plant), Zavod imeni 1-go Maya (Plant imeni the First of May),<sup>and</sup> Petushinskaya fabrika (Petushinskaya Plant) and/ KOMBinat (Kurovskoye Combine). The author thanks N.P. Rayevskiy, G.N. Petrov, V.L. Biderman, and I.A. Popov Candidates of Technical Sciences, for their comments on the manuscript. References follow several of the chapters.

## TABLE OF CONTENTS:

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Ch. I. General Considerations of Method	7
Ch. II. Basic Information on Electrical Methods of Measuring Nonelectrical Quantities	9
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Recording devices	17
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Card 3/12



## Instruments and Installations for Investigating (Cont.)

SOV/3089

**COVERAGE:** The book, consisting of eight chapters, presents an account of the development and application of modern experimental methods of investigating textile machinery. The first chapter deals with general considerations of method, while the second presents information on electrical methods of measuring nonelectrical quantities, on transducers and their connecting circuits, on recording devices, and on electrical and radio equipment. Methods of determining parameters of parts being subjected to experimental study are described in Chapter III. The fourth chapter deals with the determination of displacements, speeds, and accelerations of given points in machine parts. Chapter V describes methods of measuring tension in a single thread as well as in a group of threads under varying operating conditions. Measurements of power, forces, moments, stresses, and deformations are also discussed. Ch. VI presents methods of measuring vibrations in machine parts, while Chapter VII deals with methods and equipment for dynamic balancing of rotating parts. Chapter VIII describes special stands and equipment for testing the performance of textile-machinery units. Most of the testing equipment described in the book was developed by VNIIIT'YeKMASh. The following organizations are presently engaged in the development of instruments and installations for investigating and testing textile machinery, parts, and subassemblies: The Moskovskiy, Leningradskiy, Ivanovskiy i Kostromskoy uchebnyye tekstil'nyye instituty (Moscow, Leningrad, Ivanovo, and Kostroma Textile Institutes of Higher Education); the TsNIKhBI,

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MAKAROV, V.K.

25(2)

PHASE I BOOK EXPLOITATION

SOV/3089

Koritysskiy, Yakov Il'ich, Grigoriy Nikolayevich Zakharov, Lev Yudel'yevich Polyakovskiy, Vitaliy Konstantinovich Makarov, and Boris Tikhonovich Zonov

Pribory i ustanovki dlya issledovaniya tekstil'nykh mashin (Instruments and Installations for Investigating Textile Machinery) Moscow, Mashgiz, 1958. 278 p. 2,400 copies printed. (Series: Vsesoyuznyy nauchno-issledovatel'skiy institut tekstil'nogo i legkogo mashinostroyeniya. Sbornik trudov, No. 4)

Sponsoring Agencies: USSR. Gosudarstvennaya planovaya komissiya. Glavnoye upravleniye nauchno-issledovatel'skikh i proyektnykh organizatsiy, and Vsesoyuznyy nauchno-issledovatel'skiy institut tekstil'nogo i legkogo mashinostroyeniya.

Ed.: S.O. Dobrogurskiy, Honored Worker in Science and Technology, Doctor of Technical Sciences, Professor; Tech. Ed.: A. F. Uvarova; Managing Ed. for Literature on Machine and Instrument Construction: N.V. Pokrovskiy, Engineer.

PURPOSE: This book is intended for scientific workers, aspirants, research engineers and technicians, designers of textile machinery, and technologists in the textile industry.

Card 1/ 12

TANKUS, L. Yu., MAKAROV, V. K.

Spinning Machinery

Device for measuring the moment of friction of the roller against the ring. Tekst. prom. 12, No. 8, 1952.

9. Monthly List of Russian Accessions, Library of Congress, November 1952 ~~1953~~, Uncl.

MAKAROV, V. K. Cand Tech Sci

Dissertation: "On calculation of the  
Flywheel Masses of Looms."

6/4/50

Moscow Textile Inst

**SO Vecheryaya Moskva**  
**Sum 71**

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• L 10083-67  
ACC NR: AT6026353

content. Under atmospheric pressure and at 20°C the maximum impulse amplitude occurred at a volume ratio of air to water of 0.0145. Orig. art. has: 9 figures, 1 table, 21 formulas.

SUB CODE: .20/      SUBM DATE: none/      ORIG REF: 002/      OTH REF: 006

Card 3/3 *5pp*

L 10083-67

ACC NR: AT6026353

The constant  $C = v_{\text{liq}} x / v_A$ , where  $v_{\text{liq}}$  is the volume of the liquid,  $v_A$  is the molecular volume, and  $x$  is the molal gas content in the liquid phase. An equation is also given for the total volume of gas nuclei ( $V_k$ ) formed during cavitation at a frequency of 20 Kc in the temperature range 10-60°C, for different molal air contents ( $x$ ) dissolved in water. Experimental results showed that cavitation was highly dependent on the gas content of the liquid. With increase in temperature, the value of  $x$  had a lower effect on  $V_k$ . The value of  $V_k$  was proportional to the nucleation rate while the maximum cavitation pressure was proportional to  $T^{-3}$  where  $T$  is the absolute temperature of the liquid. High speed motion pictures were made of the cavitation process. At 24 Kc, the diameter of the cavitation bubbles went through a maximum as a function of oscillation time. This change was caused by the rise in surface tension due to vapor formation. Measurements of cavitation impulse pressure were dependent on hydrophone design. Oscillographic measurements of cavitation impulses peaked strongly at the maximum amplitudes of the free oscillations (1.2 and 3 Mc). A special thermostat was used to obtain the temperature dependence of the maximum amplitude of cavitation impulses during heating and cooling. Simultaneously, aluminum samples were tested for cavitation erosion. The strongest maxima were observed at 60°C upon heating and cooling, while some strengthening occurred after cooling below 40°C. Erosion was directly proportional to the cavitation pressure. Further tests showed that by maintaining the temperature at 80°C for 2-3 hr the cavitation action became strongest at room temperature due to lowered gas

Card 2/3

L 10083-67 EWR(1)/EWT(m)/EWP(t)/ETI/EWP(k) IJP(c) JD/WB  
 ACC NR: AT6026363 SOURCE CODE: UR/3209/66/000/001/0005/0021

AUTHOR: Makarov, V. K. (Mathematician, Assistant); Kortnev, A. V. (Professor, Candidate of technical sciences)

ORG: none

TITLE: Thermodynamic and static methods of studying ultrasonic cavitation

SOURCE: Ukraine. Ministerstvo vysshego i srednego spetsial'nogo obrazovaniya. Mezhdovedomstvennyy respublikanskiy nauchno-tekhnicheskiiy sbornik, 1966. Akustika i ul'trazvuk (Acoustics and ultrasonics), no. 1, 5-21

TOPIC TAGS: ultrasonic vibration, liquid state, cavitation, thermodynamic analysis, nucleate boiling, boiling point, temperature dependence, pressure dependence

ABSTRACT: A theoretical analysis of ultrasonic cavitation was made and experiments were conducted on acoustical measurements under cavitation conditions. An equation for the critical radius of a gas nucleus ( $R^*$ ) forming in liquids under metastable thermodynamic conditions was obtained by differentiating the total free energy of a system, in which the surface free energy is given by  $4\pi\sigma R^2$ . The number of bubbles having a radii equal to  $R^*$  is given by

$$N(g^*) = C \exp (-4\pi\sigma R^{*2}/3kT).$$

MAKAROV, V.; MANDEL', O.; ITSKOVICH, A.; PANAYOTI, Yu.

Observation of eclipsing variable stars. Astron. zh. no. 187:16-17  
D 157. (MIRA 11:6)

1. Kollektiv nablyudateley Otdeleniya Vsesoyuznogo astronomo-  
geodezicheskogo obshchestva, Odessa.  
(Stars, Variable)



MAKAROV, V.

Minima of eclipsing variable stars. Astron.tsir. no.184:21 S '57.  
(MIRA 11:4)

1. Kollektiv nablyudateley Odesskogo otdeleniya Vsesoyuznogo  
astronomo-geodezicheskogo obshchestva.  
(Stars, Variable)

MAKAROV, V.K.

Observations of the total lunar eclipse of May 13-14 in Odessa.  
Astron.tsir. no.184:16-17 S '57. (MIRA 11:4)

1. Odesskoye otdeleniye Vsesoyuznogo astronomo-geodezicheskogo  
obshchestva.  
(Eclipses, Lunar--1957)

MAKAROV, V.I., kand. tekhn. nauk

Artificial clay gypsum under conditions of prolonged use.  
Trudy GSI no.47:93-103 '64. (MIRA 18:11)

LAZAREV, B.G., akademik; LAZAREVA, L.S.; IGNAT'YEVA, T.A.; MAKAROV, V.I.

Topological changes in the Fermi surface of thallium due to impurities. Dokl. AN SSSR 163 no.1:74-75 J1 '65. (MIRA 18:7)

1. Fiziko-tehnicheskii institut AN UkrSSR. 2. AN UkrSSR (for Lazarev).

L 11388-67

ACC NR: AP7000400

the topology of the Fermi surface of indium are deduced from the dependence of the pressure effect of the investigated alloys on the residual resistance. It is pointed out that a similar variation of the pressure dependence of the transition temperature with change in impurity concentration can be observed also for Al, which has an electronic structure similar to In. This follows from observation of the de Haas - van Alphen effect in Al with Zn impurity. The authors thank B. G. Lazarev, V. G. Bar'yakhtar, I. V. Svechkarev, and T. A. Ignat'yeva for useful discussions. Orig. art. has: 2 figures.

SUB CODE: 20/ SUBM DATE: 27Jul66/ ORIG REF: 007/ OTH REF: 004

Card 2/2 egk

L 11388-67 EWT(1)/EWT(m)/EWP(t)/ETI IJP(c) JD

ACC NR: AP7000400

SOURCE CODE: UR/0396/66/004/009/0369/0372

AUTHOR: Makarov, V. I.; Volynskiy, I. Ya.

ORG: Physicotechnical Institute, Academy of Sciences UkrSSR, Khar'kov (Fiziko-  
tekhnicheskii institut Akademii nauk UkrSSR)

TITLE: Effect of impurities on the topology of the Fermi surface of indium

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki. Pis'ma v redaktsiyu.  
Prilozheniye, v. 4, no. 9, 1966, 369-372

TOPIC TAGS: indium, critical temperature, pressure effect, Fermi surface

ABSTRACT: The authors report the results of an investigation of the effect of Cd impurity on the behavior of the transition temperature ( $T_c$ ) of In under pressure, carrying out the measurements on In-Cd solid solutions with up to 4.5 at.% Cd. The method of producing the solid solutions is described. The investigated solutions were sufficiently homogeneous, as evidenced by the small difference between the widths of the superconducting transitions of the pure In ( $2 \times 10^{-3}$  °K) and of the samples ( $2 - 5 \times 10^{-3}$  °K). The plot of the superconducting transition under pressure was similar to that without pressure. The pressure was produced by an "ice" technique. The shift of the transition temperature  $T_c$  from the residual resistance without and with pressure was measured relative to  $T_c$  of a pure indium sample in one experiment. In the pressure interval 0 - 1730 kg/cm<sup>2</sup>, a linear decrease of the superconducting-transition temperature was observed for both the In-Cd alloys and the pure In. The changes in

Card 1/2

L 27467-66

ACC NR: A16008418

ly are compared with the experimental values for Al, In, Pb, Hg, Sn, Cd, Zn, La, Nb, Ta, V, Zr, and Mo and are found to be in satisfactory agreement with experiment. An expression is also given for the derivative of the critical magnetic field with respect to the pressure in terms of the Gruneisen constants and the compressibility. This makes it possible to calculate the sign and magnitude of this derivative for different metals and compare them with the experimental values. These too are found to be in fair agreement. A certain anomaly in the case of thallium in the region of pressures up to 6000 atm is probably connected with singularities of the energy spectrum of the conduction electrons. The values for Ga, Re, Ru, Th, and Ti could not be compared with experiment for lack of the Gruneisen constants. The authors thank B. G. Lazarev for a discussion of the work. Orig. art. has: 7 formulas.

SUB CODE: 2/ SUBM DATE: 00/ ORIG REF: 006/ OTH REF: 009

Card 2/2 B-G

L 27467-66 EWT(1) IJP(c) GG

ACC NR: A76008418

SOURCE CODE: UR/3137/65/000/244/0001/0006

AUTHOR: Bar'yakhtar, V. G.; Makarov, V. I.

ORG: None

TITLE: Concerning the influence of pressure on the temperature of the superconducting transition

SOURCE: AN UkrSSR. Fiziko-tekhnicheskii institut. Doklady, no. 244/T-029, 1965. K voprosu o vliyaniy davleniya na temperaturu sverkhprovodyashchego perekhoda, 1-6

TOPIC TAGS: superconductivity, phase transition, critical point, critical magnetic field, pressure effect, conduction electron, crystal lattice

ABSTRACT: In view of the lack of a theoretical explanation for the fact that in some superconductors the temperature of the superconducting transition  $T_k$  increases under pressure and in others it decreases, the authors use the already-known expression for  $T_k$  to determine an expression for the derivative of  $T_k$  with respect to pressure in terms of the experimentally observed quantities, namely the Gruneisen constants of the electrons and of the lattice and the coefficient of compressibility of the metal. The values obtained for this derivative theoretical-

Card 1/2



APPROVED FOR RELEASE: 06/23/11: CIA-RDP86-00513R001031500040-6

BELOSTOTSKIY, Isaak Abramovich; MURAVNIK, Faina Savel'yevna; SILINA,  
Alevtina Vasil'yevna; MAKAROV, V.I., red.

[Multiple-unit TS-1 trolleybus] Sochlennyi trolleibus TS-1.  
Moskva, Stroiizdat, 1965. 171 p. (MIRA 18:8)

L 3893-66  
ACCESSION NR: AP5018076

6  
results are interpreted as an experimental confirmation that one of the valleys of the Fermi surface of thallium vanishes under the influence of an impurity. "The authors thank V. G. Bar'yakhtar for a discussion." Orig. art. has: 2 formulas and 1 figure. 44, 35

ASSOCIATION: Fiziko-tehnicheskii institut Akademii nauk UkrSSR (Physicotechnical Institute, AN UkrSSR)

SUBMITTED: 16Feb65 44, 35

NR REF SOV: 007

ENCL: 00

SUB CODE: SS

OTHER: 005

*leh*  
Card 2/2

L 3893-66 EWT(1)/EWT(m)/EWP(t)/EWP(b) IJP(c) JD/GG

ACCESSION NR: AP5018076

UR/0020/65/163/001/0074/0075

AUTHOR: Lazarev, B. G. (Academician AN UkrSSR); Lazareva, L. S.; Ignat'yeva, T. A.; Makarov, V. I.

TITLE: On the change of the topology of the Fermi surface in thallium under the influence of impurities

SOURCE: AN SSSR. Doklady, v. 163, no. 1, 1965, 74-75

TOPIC TAGS: superconductivity, thallium, impurity effect

ABSTRACT: The authors observed experimentally a singular behavior in the temperature of the superconducting transition ( $T_c$ ) of thallium (change in the number of valleys on the Fermi surface) in investigations of the influence of impurities on the pressure dependence of  $T_c$ . The study was made by investigating the joint influence of impurities of different valences and of the pressure on  $T_c$  of thallium. The results show that the impurities whose valence is larger than that of thallium (Bi) decrease the positive pressure effect with increasing concentration, causing the pressure to become negative starting with a certain value of the concentration (0.2 at.%). In the case of an impurity of lower valence (Hg), the positive pressure effect increases at low concentrations. With further increase of the concentration, the positive effect decreases and becomes negative at ~0.9 at.% Hg. The

Card 1/2

L 18772-66

ACC NR: AP6002738

of the metal. Calculations based on the derived expression are in satisfactory agreement with the experimentally determined values for the majority of pure superconductors. The comparison is based on the assumption that the formula derived is correct not only for quadratic dispersion law, but for an arbitrary conduction-electron dispersion. The Gruneisen constant for the metals In, Hg, Zn, Cd, Zr, Mo, and LaB<sub>5</sub> differ from the average value ( $\gamma_e = 1.5$ ) by no more than  $\pm(0.1 - 0.2)$ . Certain anomalies in the pressure dependence of thallium are briefly discussed. The authors thank B. G. Lazarev for a discussion of the work. Orig. art. has: 7 formulas and 1 table.

SUB CODE: 20/ SUBM DATE: 20Jul65/ ORIG REF: 006/ OTH REF: 009

Card

2/2 7/7/65

1 18772-66 EWT(1)/EWT(m)/EPF(n)-2/T/EPF(t) IJP(c) JD/M/GO  
 ACC NR: AP6002738 SOURCE CODE: UR/0056/55/049/006/1934/1937

AUTHORS: Bar'yakhtar, V. G.; Makarov, V. I.

ORG: Physicotechnical Institute, Academy of Sciences Ukrainian SSR  
 (Fiziko-tekhnicheskii institut Akademii nauk Ukrainiskoy SSR)

TITLE: On the <sup>21, 44, 55</sup>effect of pressure on the superconducting transition temperature

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 49, no. 6, 1965, 1934-1937

TOPIC TAGS: pressure effect, superconductivity, phase transition, crystal lattice structure, metal property, indium, mercury, zinc, cadmium, zirconium, molybdenum, lanthanum, thallium

ABSTRACT: (21, 44, 55) Starting from the well known expression for the temperature of the superconducting transition, the authors derive an expression for the derivative of this temperature with respect to the pressure in terms of experimentally observable quantities such as the Gruneisen constants of the electron and of the lattice, and the compressibility  $Z$

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L 17655-66

ACC NR: AP6002728

4

impurity density) of the superconducting transition with change in the Fermi-surface topology. It is assumed that the anisotropy of the electron-electron interaction is small and only the nonlinear change in  $T_k$  under the influence of the impurities, due to modification of

the Fermi-surface topology is considered. It is shown that this mechanism, unlike that considered by D. Markowitz and L. P. Kadanoff (Phys. Rev. v. 131, 563, 1963) may lead to both a nonlinear decrease and a nonlinear increase of  $T_k$  with increasing impurity concentration.

The expression derived for  $T_k$  consists of the value of  $T_k$  for the pure semiconductor, plus a term which allows for the combined effect of the singularities in the topology of the Fermi surface and the scattering of the electrons by the impurities. Author thanks A. I. Akhiezer, I. A. Akhiezer, I. M. Lifshits, and G. M. Eliashberg for a discussion of the work. Orig. art. has: 1 figure and 41 formulas.

SUB CODE: 20/ SUBM DATE: 24Jun65/ ORIG REF: 014/ OTH REF: 006

Cord 2/2 nat

L 17655-66 EWT(1) IJP(c) GG

ACC NR: AP6002728 SOURCE CODE: UR/0056/65/049/006/1858/1867

AUTHORS: Khar'yakhtar, V. G.; Fal'ko, I. I.; Makarov, V. I. <sup>56</sup><sub>52</sub>  
8

ORG: Physicotechnical Institute, Academy of Sciences SSSR (Fiziko-  
tekhnicheskiy institut Akademii nauk SSSR; Khar'kov State University  
(Kar'kovskiy gosudarstvennyy universitet)

TITLE: Effect of impurities on the superconducting transition temperature

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 49, no. 6, 1965, 1858-1867

TOPIC TAGS: superconductivity, phase transition, impurity scattering, critical point, electron interaction

ABSTRACT: The authors investigate the effect of diamagnetic impurities on the superconducting transition temperature for the case when addition of impurities makes it possible to modify the topology of the Fermi surface of the superconductor. This is done by determining the nonlinear change in the temperature  $T_k$  ( $\sim \sqrt{n \cdot \ln n}$ , where  $n$  is the

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2

L 62230-65

ACCESSION NR: AP5019219 2

found that at high pressures (20,000–28,000 atm) the dependence of the transition temperature ( $T_c$ ) on the pressure (P) was similar for the mercury-bearing and pure thallium, but different at low pressures (up to approximately 7000 atm), with the sign of the effect reversing at a concentration  $\sim 0.9\%$  Th. It is suggested that this behavior of thallium and its alloys is related to the characteristic features of the pressure dependence of the density of states on the Fermi surface. In particular, the results confirm hypotheses advanced in the earlier paper, that thallium has two components in the pressure dependence of  $T_c$ , linear and nonlinear, and that the impurity content affects mainly the nonlinear component. It is possible that the impurity dependence affects the Fermi-surface topology of thallium. Orig. art. has: 3 figures. [02]

ASSOCIATION: Moskovskiy gosudarstvennyy universitet (Moscow State University); Fiziko-tekhnicheskiy institut Akademii nauk UkrSSR (Physicotechnical Institute, Academy of Sciences, UkrSSR)

SUBMITTED: 05Feb65

ENCL: 00

SUB CODE: A4,88

NO REF BOT: 005

OTHER: 002

ATD PRESS: 46 25

<sup>K-1</sup>  
Card 2/2



L 62230-65 EPA(s)-2/EWA(h)/EWP(k)/EWA(c)/EWT(l)/EWT(m)/EWP(b)/EWA(d)/EWP(t) IJP(c)  
 GG/JD/PN/JG

ACCESSION NR: AP5019219

UR/0056/65/049/001/0085/0089

AUTHOR: Brandt, N. B.; Ginzburg, N. I.; Ignat'yeva, T. A.; Lazarev, B. G.;  
 Lazareva, L. S.; Makarov, V. I.

TITLE: Influence of impurities on the pressure effect in thallium 47

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 49, no. 1, 1965,  
 85-89

TOPIC TAGS: thallium, mercury, mercury impurity, impurity effect, pressure effect,  
 Fermi surface, high pressure research

ABSTRACT: This is a continuation of an earlier study (ZhETF v. 48, 1065, 1965) of the influence of impurities on the superconducting transition temperature of thallium under pressure. In the present study, to check on some of the hypotheses advanced in the earlier paper, the authors extended the pressure range to 28,000 atm, and measured the pressure effect in both pure and mercury-bearing thallium, using the same thallium-mercury alloys as in the earlier work. Cylindrical samples of 2.5 mm diameter and 3-4 mm length were used, and the superconducting transition was measured with a tin manometer and recorded by an induction method. The apparatus and procedure employed were the same as described in detail elsewhere (PTE no. 2, 131, 1960; FTT v. 3, 3461, 1961), apart from slight modifications. It was

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L 00563-66

ACCESSION NR: AP5016565

change in the topology of the Fermi surface is associated with the pressure-induced change in the Fermi energy, and compute the variation of the superconducting transition temperature with variation of this energy. The relative change of the transition temperature is found to be of the order of the square root of the ratio of the Debye temperature to the Fermi energy. The relation between the transition temperature and the impurity concentration is also investigated. "The authors thank A. I. Akhiezer, B. G. Lazarev, T. A. Ignat'yeva, and N. S. Tereshina for a discussion of the results." Orig. art. has: 2 figures and 12 formulas.

ASSOCIATION: Fiziko-tekhnicheskiy institut Akademii nauk Ukrainskoy SSSR (Physicotechnical Institute, Academy of Sciences, UkrSSR)

SUBMITTED: 15Jan65

ENCL: 00

SUB CODE: GP

NR REF SOV: 007

OTHER: 004

Card 2/2

L 00563-66 EWT(1)/ENT(m)/EWP(t)/ENP(k)/EWP(b)/EWA(c) IJP(c) JD/HW/GG

ACCESSION NR: AP5016565

UR/0056/65/048/006/1717/1722

AUTHORS: Makarov, V. I.; Bar'yakhtar, V. G.

TITLE: Anomalies in the superconducting transition temperature under pressure

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 48, no. 6, 1965, 1717-1722

TOPIC TAGS: thallium, superconductivity, pressure effect

ABSTRACT: This investigation was stimulated by the fact that thallium behaves under pressure in a manner different from other metals, and was aimed at checking the hypothesis that the nonlinear part of the pressure dependence of the transition temperature is connected with a change in the topology of the Fermi surface under pressure. The hypothesis is verified by starting out from a very simple model of superconductivity; the authors show that the change

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SOV-46-4-3-12/18

Visualisation of Ultrasonic Pulses with High Frequency Carrier

There are 3 figures.

ASSOCIATION: Kafedra akustiki Moskovskogo gosudarstvennogo  
universiteta (Chair of Acoustics of the Moscow State  
University)

SUBMITTED: February 6, 1958.

1. Ultrasonic radiation--Visibility
2. Ultrasonic radiation
- Reflection
3. Ultrasonic radiation--Photography
4. Sound
- Propagation

Card 2/2

SOV-46-4-3-12/18

AUTHOR: Makarov, V. I.

TITLE: Visualisation of Ultrasonic Pulses with High Frequency Carrier (Vizualizatsiya ul'trazvukovykh impul'sov s vysokochastotnym zapolneniyem)

PERIODICAL: Akusticheskiy Zhurnal, 1958, Vol 4, Nr 3, pp 285-286(USSR)

ABSTRACT: A brief note on the visualisation of pulses. Photographs obtained with this system are shown in Figs.1, 2 and 3. Fig.1 shows a photograph of ultrasonic pulses (carrier frequency 1 Mc/s) propagated in water. The pulses were produced by a quartz oscillator (top right) and were reflected by a metallic plate (lower left). It was possible to study each pulse separately. Fig.2 shows a photograph of a cylindrical shell placed in the path of the pulse propagated in the direction shown by the arrow. The beginning of the formation of a sonic field inside the shell can be seen. Fig.3 shows a photograph of a separate ultrasonic pulse propagated in water with a carrier frequency of 4 Mc/s.

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APPROVED FOR RELEASE: 06/23/11: CIA-RDP86-00513R001031500040-6

MAKAROV, V. I., Cand. Phys-Math. Sci. (diss) "Optical Investigation of Sound-Penetrability of Sheets and Films." Moscow, 1961, 8 pp. (Acad. of Sci. USSR, Acoustical Instit.) 180 copies (KL Supp 12-61, 252).

Germany  
(Democr.  
(Republ.)

Excerpts from the Program and Information Circular. Reports to be submitted for the Third Intl. Congress on Acoustics, NRPAP, Stuttgart, GFR, 1-8 Mar. 1960

S/046/60/006/02/15/019  
B014/B014

AUTHORS: Makarov, V. I., Fadeyeva, N. A.

TITLE: Wave Emission by Shells Located in a Sound Field

PERIODICAL: Akusticheskiy zhurnal, 1960, Vol. 6, No. 2, pp. 261-263

TEXT: Fig. 1 shows the sound field in a steel cylinder treated with ultrasonic waves in one direction (arrow). The beam is so wide that a diffraction grating is formed, whose period is equal to the wavelength. The authors studied the determination of the propagation velocity of the waves from the radius of the caustic. Finally, the study of shells of different shapes is described (Figs. 2 and 3). It is shown that the method described may also be used to study sound fields in complex shells. There are 3 figures and 8 references: 4 Soviet, 3 German, and 1 American. ✓ B

ASSOCIATION: Kafedra akustiki Moskovskogo gosudarstvennogo universiteta  
(Chair of Acoustics of Moscow State University)

SUBMITTED: September 9, 1959

Card 1/1



SOV-46-4-3-10/18

AUTHORS:Kuz'michev, Yu. M. and Makarov, V. I.

TITLE: Ultrasonic Excitation of a Cylindrical Shell (Vozbuzhdeniye tsilindricheskoy obolochki ul'trazvukom)

PERIODICAL: Akusticheskiy Zhurnal, 1958, Vol 4, Nr 3, pp 282-283 (USSR)

ABSTRACT: Three photographs are shown of acoustic excitation of a cylinder. In Fig.1 O is the cylindrical shell irradiated with ultrasonic waves in the direction shown by the arrow. The diaphragm D passes through two beams corresponding to the calculated widths of the excitation zones. A piece of porous rubber R is placed inside the shell to prevent direct transmission of sound through the wall of the shell. As can be seen, there is a central region, co-axial with the shell, in which the sound is absent altogether. There are 3 figures.

ASSOCIATION: Kafedra akustiki Moskovskogo gosudarstvennogo universiteta (Chair of Acoustics of the Moscow State University)

SUBMITTED: February 14, 1958.

Card 1/1

1. Cylindrical shells--Excitation 2. Ultrasonic radiation--Properties

APPROVED FOR RELEASE: 06/23/11: CIA-RDP86-00513R001031500040-6

MAKAROV, V. I. and RZHEVKIN, S. N.

"Ultrasonic Wave Excitation in Plates and Shells."

paper presented at the 4th All-Union Conference on Acoustics, Moscow, 26 May - 2 Jun 58.

MAKAROV, V. I.

"Investigation of Phenomena Accompanying the Propagation of Ultrasound and Methods to be used in Work in this Field: Methods for Making Ultrasound Fields Visible."

report presented at the 6th Sci. Conference on the Application of Ultrasound in the investigation of Matter, 3-7 Feb 1958, organized by Min. of Education RSFSR and Moscow Oblast Pedagogic Inst. in N. K. Krupskaya.

USSR/Acoustics - Ultrasonics, J-4

Abst Journal: Referat Zhur - Fizika, No 12, 1956, 35563

Abstract: anisotropy of the molecular refraction, changing as a result the coefficient of refraction. This leads to the possibility of the diffraction of light by shear waves, although indeed a weaker possibility than in the case of longitudinal waves. The possibility of visualizing shear waves without polarization optics is attributed to the greater sensitivity of the installation.

*MAKAROV, V. I.*  
USSR/Acoustics - Ultrasonics, J-4

Abst Journal: Referat Zhur - Fizika, No 12, 1956, 35563

Author: Aver'yanova, V. G., Makarov, V. I., Rzhevkin, S. N.

Institution: Moscow State University, USSR

Title: Visualization of Shear Ultrasonic Waves in Transparent Solid Bodies

Original

Periodical: Akust. zh., 1956, 2, No 2, 224-225

Abstract: Using a sensitive Tepler installation in (flint) glass blocks in nonpolarized light, the standing shear waves, excited by a Y-section quartz plate, was observed. At 805.6 kc the speed of the shear wave was 2,481 m/sec. The running shear waves were observed upon reflection of the longitudinal wave at the boundary between the glass and the air in the form of a light beam against the background of the interference of the reflected longitudinal and shear waves. Mueller (Mueller, H., Physics, 1935, 6, 179-184) has shown theoretically that the elastic stresses produce an

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ACCESSION NO: APS010499

pies, inside and outside the pressure vessel respectively. The tests show that even small Bi, Sb, or Hg impurity concentrations can reverse the sign of the pressure effect in thallium, making it negative. The anomalous behavior of thallium is attributed to a complex energy dependence of the electron state density near the Fermi level, and to a sharp impurity effect in the energy spectrum of the thallium conduction electrons. The authors thank V. B. Laz'yukov for a discussion of the results. Orig. art. has: 8 figures and 1 formula.

ASSOCIATION: Fiziko-Tekhnicheskoy Institut Akademi Nauk Ukrainskoy SSR (Physico-Technical Institute, Academy of Sciences, USSR).

ENGLISH: 00001

ENGL: 00

SUB CODE: 25, 0P

RUSSIAN: 00001

OTHER: 000

[illegible][illegible]

effect in the pressure dependence of the superconducting tempera-  
ture  $T_c$ . B

UDC 537.874.01  
 1966  
 ISSN0013-788X  
 1966/04  
 1966

1. Effect of temperature, pressure dependence, impurity effect,  
2. transformation of impurity effect

Abstract. The superconducting transition temperature of 99.9999% pure thallium mixed with high-purity bismuth, mercury, and antimony in the form of wires 0.4 mm in diameter and 15--20 mm long. The inhomogeneous distribution was evidenced by the  $(2-3) \times 10^{-3}$  K superconducting transition. High pressure was produced by the iodine anvil method and monitored with a superconducting conductor accurate to  $\pm 50$  kbar. The effect was measured by a potentiometric method, using two sam-

## Conclusions

ACCESSION NR: AP4025913

ference in pressure variation between thallium and other superconductors such as lead, indium, and aluminum. An impurity with valence lower than thallium (Hg, Cd) lowers  $T_c$ , while one with higher valence (Bi, Sb) raises it. Differences in the atomic radius likewise have a different effect on  $T_c$ . In this respect thallium is no different from other superconductors, and the impurities affect  $T_c$  in accordance with the differences in their electron free paths, valences, and atomic radii. Orig. art. has: 1 figure.

ASSOCIATION: Fiziko-tekhnicheskiy institut AN UkrSSR (Physicotechnical Institute, AN UkrSSR)

SUBMITTED: 27Aug63

DATE ACQ: 16Apr64

ENCL: 01

SUB CODE: PH.

NO REF SOV: 001

OTHER: 004

Card

2/2



ACCESSION NR: AP4025913

S/0056/64/046/003/0829/0830

AUTHORS: Lazarev, B. G.; Lazareva, L. S.; Makarov, V. I.; Ignat'yeva, T. A.

TITLE: Effect of impurities on the superconducting transition temperature in thallium

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 46, no. 3, 1964, 829-830

TOPIC TAGS: thallium, superconductivity, superconducting transition, superconducting transition temperature, impurity effect, impurity valence, impurity atomic radius, electron mean free path, thallium superconductivity, thallium superconductivity pressure variation

ABSTRACT: The effect of impurities having various valences and atomic radii on the superconducting transition temperature ( $T_c$ ) of thallium is investigated, in view of the established marked dif-

Cord

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S/056/63/044/002/015/065  
 3102/3186

Features of the pressure ...

be explained by changes of the Fermi surface topology. Taking into consideration the difference in electron-group state densities at the Fermi surface, where the lower state density corresponds to the higher electron-phonon interaction constant  $g \sim m^{-1/2}$ , the contribution of the small group ( $m_{\text{eff}} = m_1$ ) is estimated. With  $q_1/q_2 = m_1/m_2$ , it is found that  $q_1$  could amount to  $\sim 10\%$  of  $q_2$ . There is 1 figure.

ASSOCIATION: Fiziko-tekhnicheskii Institut Akademii nauk Ukrainsskoy SSR  
 (Physicotechnical Institute of the Academy of Sciences  
 Ukrainsskaya SSR)

SUBMITTED: September 12, 1962

Card 2/2

S/056/63/044/002/015/065  
B102/B186

AUTHORS: Lazarev, B. G., Lazareva, L. S., Makarov, V. I.  
TITLE: Features of the pressure dependence of the critical temperature of thallium  
PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 44, no. 2, 1963, 461-482

TEXT: The pressure dependence of  $T_{cr}$  was measured for annealed single crystals of pure thallium ( $R_{4.20K}/R_{cr} \sim 2 \cdot 10^{-4}$ ) in the range from zero to  $1730 \text{ kg/cm}^2$ , and the curve obtained was completed with the help of data by Jennings and Swenson (Phys. Rev. 112, 31, 1958) and Bowen and Jones (Proc. Roy. Soc., 254, 522, 1960). The following were noted: linear increase of  $T_{cr}$  with  $p$  in the range  $0 - 1500 \text{ kg/cm}^2$  ( $dT_{cr}/dp \approx (0.4 \pm 0.1) \cdot 10^{-5} \text{ deg/atm}$ ; rapid increase between  $1500$  and  $1730 \text{ kg/cm}^2$ ; decrease at  $p > 1730 \text{ kg/cm}^2$ . This complex behavior is possibly connected with electron transitions in the conduction electron spectrum and could

Card 1/2

BAR'YAKHTAR, V.G.; MAKAROV, V.I.

Oscillations of tunnel current in a magnetic field. Dokl.  
AN SSSR 146 no.1:63-64 S '62. (MIRA 15:9)

1. Fiziko-tekhnicheskii institut AN Ukrainskoy SSR. Predstavleno  
akademikom N.N. Bogolyubovym.  
(Electric currents) (Magnetic fields)

LAZAREV, B.G.; LAZAREVA, L.S.; MAKAROV, V.I.

On the difference in the effect of impurities and plastic deformation on the temperature of a superconducting junction in a metal. Zhur.eksp.i teor.fiz. 43 no.6:2311-2312 D '62.  
(MIRA 16:1)

1. Fiziko-tehnicheskii institut AN UkrSSR.  
(Superconductivity)  
(Deformations (Mechanics))

Superconductivity of tin ...

20456  
S/056/61/040/002/010/047  
B102/B202

nic properties of the metal must be studied. It is of interest that In with linear  $T_c(p)$  has a most simple Fermi surface (closed, almost spherical), whereas thallium (like tin) with its complex function  $T_c(p)$  has an anisotropic Fermi surface ("corrugated" planes). There are 2 figures and 8 references: 5 Soviet-bloc and 3 non-Soviet-bloc.

ASSOCIATION: Fiziko-tekhnicheskiy institut Akademii nauk Ukrainskoy SSR  
(Institute of Physics and Technology of the Academy of Sciences Ukrainskaya SSR)

SUBMITTED: September 1, 1960

Card 3/3

20456

S/056/61/040/002/010/047  
B102/B202

## Superconductivity of tin ...

course of  $T_c(p)$  with  $dT_c/dp = (-4.4 \pm 0.2) \cdot 10^{-5}$  deg/atm in the range of from 0 to 100 atm. At higher temperatures, a deviation from linearity was observed (see Fig.2, dashed curve, obtained from two tin specimens A and O; the dashed line corresponds to  $dT_c/dp = (-5.7 \pm 0.2) \cdot 10^{-5}$  deg/atm.).

The measurements were made by the differential and the ice method (the latter in the range 500 - 1200 atm). In the range of from 800 to 1730 atm,  $dT_c/dp$  was  $(-4.6 \pm 0.2) \cdot 10^{-5}$  deg/atm. Since this curve runs in parallel with the indium curve, it can be assumed that between 100 and 800 atm a transition takes place from one straight line to the other. The effect of pressure on superconductivity has hitherto not been fully explained. The new theory of superconductivity gives the relation  $T_c \sim \Theta \exp(-2/gv)$ , where  $\Theta$  is the Debye temperature,  $g$  the electron-phonon interaction constant, and  $v$  the electron density. Compression on all sides of the metals leads to an increase of  $\Theta$  and, thus, to a linear increase of  $T_c$ . To explain the course of  $T_c(p)$ , the pressure-dependent change of the electro-

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24.2140 (1072, 1160, 1395)

20456

24.7700

1055 1138, 1559 also 1418

S/056/61/040/002/010/047  
B102/B202AUTHORS: Kan, L. S., Lazarev, B. G., Makarov, V. I.

TITLE: Superconductivity of tin and indium under pressure

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki,  
v. 40, no. 2, 1961, 457 - 459

TEXT: In previous papers (ZhETF, 14, 163, 1944 and 18, 825, 1948), the authors described studies of the effect of pressure on the critical temperature of tin and indium at 1730 and 1330 kg/cm<sup>2</sup>. They observed shifts ( $\Delta T_c$ ) of less than 0.1°. If  $dT_c/dp$  is assumed to proceed linearly, the following shift rates are obtained:  $(-5.7 \pm 0.2) \cdot 10^{-5}$  deg/atm for tin, and  $(-4.6 \pm 0.2) \cdot 10^{-5}$  deg/atm for indium. In recent times, the correctness of these values has been doubted. For this reason, the measurements were repeated in the range of from 0 to 1730 kg/cm<sup>2</sup>. For indium,  $T_c(p)$  was linear also in this range, and it was found that  $dT_c/dp = (-4.4 \pm 0.3) \cdot 10^{-5}$  deg/atm (see solid line in Fig.2). Tin, however, showed a linear

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ACCESSION NR: AT4043149

representation of the attenuation function  $V(x, y, q)$  as well as the convergence of the series expansion which was used in computation. Two sets of curves of  $W$  for transmitter elevations from 0-60 km are given for frequencies of 10-kc and 100 kc and  $\epsilon_m = 10$  and  $\sigma = 10^{-3} \text{ (ohm}\cdot\text{m)}^{-1}$ . Finally, plots of electric field components as functions of time for sine and cosine signals modulated by a step function are given. Tables 1-4 give the values of  $v$ ,  $\arg V$ ,  $\text{Re } V$  and  $\text{Im } V$  for ranges from 10-10,000 km and frequencies from 2 kc - 10 mc for the following combinations of the dielectric constant  $\epsilon_m$  and conductivity  $\sigma$ :  $\epsilon_m = 80$  and  $\sigma = 1 \text{ (ohm}\cdot\text{m)}^{-1}$ ,  $\epsilon_m = 20$  and  $\sigma = 10^{-2}$ ,  $\epsilon_m = 10$  and  $\sigma = 10^{-3}$ ,  $\epsilon_m = 5$ ,  $\sigma = 10^{-4}$ . Tables 5-8 give the values of the parameter  $t_s$  as  $\text{Re } t_s$ ,  $\text{Im } t_s$ ,  $|t_s|$  and  $\arg t_s$  for values of  $s$  from 1-10 and for frequencies from 2 kc-10 mc for the same combinations of  $\epsilon_m$  and  $\sigma$ . Finally, table 9 gives the value of the field for modulated signal for time  $t$  from  $10^{-3}$  - 35  $\mu\text{sec}$  and for  $\epsilon_m = 20$ ,  $\sigma = 10^{-2}$  and  $\epsilon_m = 10$  and  $\sigma = 10^{-3}$  for a plane earth and for an earth of 2 layers, one of which is 50 meters thick. The range parameter extends from 10 to 800 km. Orig. art. has: 96 equations, 92 figures and 9 tables.

ASSOCIATION: Leningradskiy universitet (Leningrad University)

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ACCESSION NR: AT4043149

attenuation function  $V(x, y, q)$  for a spherical earth introduced by V. A. Fok (AN SSSR, 1946) is used. It is argued that the availability of tables of the attenuation function for a large number of frequencies enables one to compute the attenuation for an arbitrary signal modulation. After the singularities of the field at the imaginary axis of the complex frequency plane have been separated, a numerical integration method is proposed for evaluation of "transient" spectral components. Three specific examples are worked out in detail: unit step dipole current and sine and cosine dipole current modulated by a unit step function. The first set of curves gives the amplitude and phase as a function of range of the plane earth attenuation function  $W$  and spherical earth attenuation function  $V$  for ranges from 0-600 km, frequencies from 2kc-10mc, earth dielectric constants of 5, 10, 20 and 80 with corresponding conductivities of  $10^{-4}$ ,  $10^{-3}$ ,  $10^{-2}$  and  $1$  (ohm·m) $^{-1}$ . From these curves, a set of curves is generated which gives a plot of range as a function of frequency for constant percentage difference in amplitude and phase of  $W$  and  $V$ . This set of curves defines the conditions under which a spherical earth model must be used to achieve a prescribed accuracy. For the same set of surface conditions and frequencies the far field values of  $V$  (amplitude and phase) are then plotted for ranges up to 10,000 km. The next group of curves illustrates the frequency variation of the parameters  $t_1$ ,  $t_2$  and  $q$  of Fok's

Card 2/4

ACCESSION NR: AT4043149

S/2754/64/000/003/0005/0191

AUTHOR: Gynninen, E. M., Makarov, V. I., Novikov, V. V., Rybachek, S. T.

TITLE: Propagation of electromagnetic impulses and of their harmonic components above the surface of the earth

SOURCE: Leningrad. Universitet. Problemy\* difraktsii i rasprostraneniya voln, no. 3, 1964. Rasprostraneniye radiovoln (Radio wave propagation), no. 3, 5-191

TOPIC TAGS: radio wave, radio wave propagation, electromagnetic propagation, surface wave propagation, ionosphere, path attenuation

ABSTRACT: The article presents the results of computations of surface wave propagation path properties in the form of graphs and tables with emphasis on the spectral characteristics of the path. The variation in the conductivity and dielectric constant of the earth with frequency is neglected. The multipath character of ionospheric reflections is also neglected by assuming proper gating function at the receiver. In the theoretical section, formulas for the field of a vertical electric dipole, radiating CW energy above a homogeneous or multi-layer flat or spherical earth, are introduced, using the surface impedance approach. Refraction is taken into account by introducing the equivalent radius of the earth. The path

Card 1/4

KAZAKOV, A.A., kand. tekhn. nauk; MAKAROV, V.I., inzh.

Block-type semiautomatic pulse-relay block system. Trudy  
MIIT no.170:91-104 '63. (MIRA 17:6)

APPROVED FOR RELEASE: 06/23/11: CIA-RDP86-00513R001031500040-6

FRIDL'YAND, M.G., inzh.; MAKAROV, V.I., inzh.; ALEKSEYEV, B.D., inzh.

Seam welding of strong and dense girth joints on variable-  
thickness metals. Svar. proizvod. no.7:25-27 J1 '63.  
(MIRA 17:2)

BARANOVA, N.M.; KALYAZIN, Ye.P.; MAKAROV, V.I.

Determination and identification of carbonyl compounds in  
hydrocarbons at low concentrations. Zhur. anal. khim. 19  
no.3:398-399 '64. (MIRA 17:9)

1. Moskovskiy gosudarstvennyy universitet imeni Lomonosova.

MAKAROV, V.I.

Extraction-spectrophotometric method for the determination of  
small amounts of cyclohexene in cyclohexane. Zhur. anal. khim  
19 no. 1:140-141 '64. (MIRA 17:5)

1. Institut neftekhimicheskogo sinteza AN SSSR, Moskva.

ACCESSION NR: AP4032517

very small. The aggregate state, i.e., temperature does not affect the relative ratio of these products (methane, ethane, ethylene, propane and acetylene, compound a, propylene, n-butane, butene-1, butene-2 and butadiene), but significantly affects their yield (which is about 10 times greater in the gaseous than in the liquid phase). The compound a is a 3-carbon atom hydrocarbon which is neither allene nor propyne (possibly cyclopropane). Three possible types of monomolecular decomposition of the excited cyclohexane molecules and the "cage effect" are shown in figure 1 of the enclosure to explain the obtained results. "The authors thank Yu. A. Kolbanovsko for assistance in the work." Orig. art. has: 3 figures and 2 tables.

ASSOCIATION: Institut neftekhimicheskogo sinteza AN SSSR im. A. B. Topchiyeva  
(Institute of Petrochemical Synthesis, AN SSSR)

SUBMITTED: 11Aug63

DATE ACQ: 13May64

ENCL: 03

SUB CODE: OC

NO REF SOV: 004

OTHER: 013

Card 2/52



ACCESSION NR: AP4032517

S/0204/64/004/002/0314/0319

AUTHOR: Makarov, V. I.; Polak, L. S.

TITLE: Radiolysis of cyclohexane. Effect of temperature and the aggregate state of cyclohexane.

SOURCE: Neftekhimiya, v. 4, no. 2, 1964, 314-319

TOPIC TAGS: cyclohexane, radiolysis, temperature effect, aggregate state, gaseous cyclohexane, liquid cyclohexane, solid cyclohexane, carbon hydrogen bond rupture, cyclohexene, dicyclohexyl, carbon carbon bond rupture, cyclopropane, monomolecular decomposition, excited cyclohexane

ABSTRACT: The effect of temperature and of the aggregate state of cyclohexane on the yield of its radiolysis products was investigated and explained. The yield of products formed by the rupture of the C-H bond (cyclohexene and dicyclohexyl) is independent of temperature in the -195C to +50C range (solid to liquid). The yield of hydrogen increased very slightly with increase in temperature. The yield of C<sub>1</sub> - C<sub>4</sub> products formed by the rupture of the C-C bond was determined at a dosage of  $3 \times 10^{-19}$  electron volts/ml. The absolute value of the yields was

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AID Nr. 983-10 5 June

RADIATION-INDUCED REACTION (Cont.) S/204/63/003/002/003/006

For  $\text{CO}_2$  concentrations from  $6 \cdot 10^{-4}$  to 8.9 mol/l, the maximum acid yield, 0.9, was at 2 mol/l of  $\text{CO}_2$ , and the maximum carbonyl-compound yield, 0.29 molecule/100 ev, at 8.9 mol/l of  $\text{CO}_2$ . The carbonyl compounds are assumed to result from the direct effect of radiation on the dissolved  $\text{CO}_2$ , which is in good agreement with their linear yield increase with increasing  $\text{CO}_2$  concentration. The work was done at the Moscow State University imeni M. V. Lomonosoy.

[EDW]

Cond 2/5

MAKAROV, V. I.

AID Nr. 983-10 5 June

RADIATION-INDUCED REACTION OF HEPTANE, NONANE, OR CUMENE  
WITH CO<sub>2</sub> (USSR)

Kalyazin, Ye. F., and V. I. Makarov, *Neftekhimiya*, v. 3, no. 2, Mar-Apr 1963,  
227-232. S/204/63/003/002/003/006

The reaction of n-heptane, n-nonane, or cumene with CO<sub>2</sub> was induced by x-radiation and γ-radiation from a Co source in order to study the effect of radiation intensity, temperature, and CO<sub>2</sub> concentration on the reaction. The reaction was carried out in sealed ampoules. The yield of acids, esters, and carbonyl compounds was found to be independent of γ-ray intensity in the range from  $3.8 \cdot 10^{16}$  to  $1.1 \cdot 10^{14}$  ev/ml·sec. The reaction showed no temperature dependence from -77 to +145°C. The radiation yield varied as a function of CO<sub>2</sub> concentration.

Card 1/2

APPROVED FOR RELEASE: 06/23/11: CIA-RDP86-00513R001031500040-6

MAKAROV, V.I.

Some problems in the training of managers. 1971. 107 p. 10.500-10. 164.  
USSR 171117

ACCESSION NR: AT4012201

between temperature and area which could be expressed by the equation:

$$S_{\star} T_{\star}^4 \int_{\lambda_1}^{\lambda_2} \frac{1}{\lambda^5} d\lambda = \text{const.}$$

where the numerical value of the constant is approximately  $10^{28}$  ergs/sec. "In conclusion, I would like to thank M. N. Gnevyshchev for suggesting this topic, and Prof. V. A. Krat for his valuable advice and criticism." Orig. art. has: 7 graphs, 3 tables and 18 formulas.

ASSOCIATION: Astronomicheskaya observatoriya, Pulkovo (Pulkovo Observatory)

SUBMITTED: 00

DATE ACQ: 27Feb64

ENCL: 01

SUB CODE: AS

NO REF SOV: 009

OTHER: 008

Card

2/2

ACCESSION NR: AT4012201

S/2797/63/023/002/0047/0056

AUTHOR: Makarov, V. I.

TITLE: Relationship between the temperature at the center of a sunspot and its area

SOURCE: Pulkovo. Astron. observ. Izvestiya, v. 23, no. 2(173), 1963, 47-56

TOPIC TAGS: sunspot, solar flacula, sunspot temperature, sunspot temperature area dependence, solar photometry, photoheliogram, solar brilliance sine Theta dependence

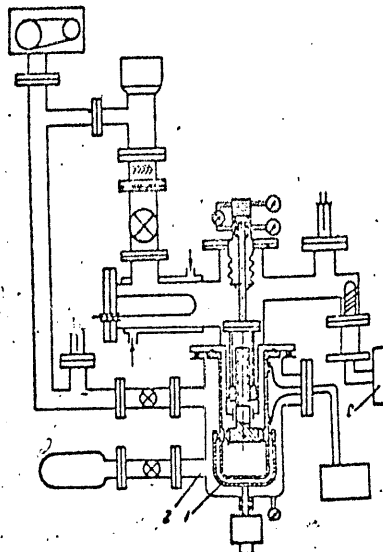
ABSTRACT: Photometric data obtained on sunspots since 1948 at the Gornaya astronomicheskaya stantsiya Glavnoy astronomicheskoy observatorii AN SSSR (Mountain Station, Central Astronomical Observatory AN SSSR) have been evaluated to determine the relationship between temperature and area. However, since the photoheliograms have been standardized daily only since Dec., 1960, a way of utilizing the older records was first developed. It was found that the phenomenon of decreasing solar brilliance toward the edge of the solar disk can be used effectively for standardizing photoheliograms. The procedure for correcting the observed data for image blur and light dispersion on the solar disk is described in detail. Given the effective wavelength, the temperature of the sunspot was determined by comparing the energy distribution in certain sections of its spectrum with that of the photosphere spectrum. As shown by Fig. 1 in the Enclosure, there was a definite relationship

Card 1/82

DOLIDZE, M.V.; MAKAROV, V.I.

Spectrophotometry of the nucleus of Arend-Roland's comet (1956 h).  
Biul.Abast.astrofiz.obser. no.26:81-87 '61. (MIRA 15:3)  
(Comets--1956)

ACC NR: AP7009126



1--component to be tested; 2--vacuum chamber; 3--gas analyzer

SUB CODE: 13, ~~17~~ SUBM DATE: 15Jul65

Card 2/2



ACC NR: AP7009126

SOURCE CODE: UR/0413/67/000/003/0115/0115

INVENTOR: Mednikov, M. I.; Makarov, V. I.

ORG: None

TITLE: A method for studying the fatigue strength of thin-walled hermetically sealed components. Class 42, No. 191180

SOURCE: Izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, no. 3, 1967, 115

TOPIC TAGS: test facility, hermetic seal, fatigue strength

ABSTRACT: This Author's Certificate introduces a method for studying the fatigue strength of thin-walled hermetically sealed components on a test stand with a vacuum chamber using a registration device. The procedure is designed for determining the point where microscopic fatigue cracks begin to form and for studying the process of crack propagation. The part to be tested is placed in the vacuum chamber in such a way that the chamber is divided into two sections. The spaces above and below the specimen are evacuated and the upper space is then filled with a test gas such as helium. The part is loaded according to a predetermined law and the registration instrument (gas analyzer) is used for determining the increase in the quantity of test gas beneath the component due to the development of microscopic fatigue cracks in the given specimen during loading. The readings of the instrument are used for studying the process of appearance and propagation of microscopic fatigue cracks.

Card 1/2

UDC: 620.178.73-762

KOVTUNENKO, M.P., inzh.; GROYSER, M.V.; GRODSKIY, Ye.Ya.; SMIRNOV, V.M.;  
MAKAROV, V.I.

Use of reinforced concrete structures of plant manufacture. Gidr.  
i mel. 16 no.6:47-52 Je '54. (MIRA 17:9)

1. Goszemvodkhoz RSFSR (for Kovtunenکو). 2. Volgogradvodstroy  
(for Groyser, Makarov). 3. Nauchnoissledovatel'skiy institut sel'-  
skogo stroitel'stva (for Grodskiy). 4. Yuzhnyy gosudarstvennyy  
institut po proyektirovaniyu vodokhozyaystvennogo i meliorativnogo  
stroitel'stva (for Smirnov).

MAKAROV, Vladimir Ivanovich; ZAVADSKIY, Ye.I., nauchn. red.;  
BEREZOVSKAYA, A.L., Ved. red.

[Machinery for the construction of cement-concrete pavements]  
Mashiny dlia stroitel'stva tsementnobetonnykh dorozhnykh  
pokrytii. Moskva, Vysshaia shkola, 1964. 206 p.  
(MIRA 18:3)

ZEMSKIY, Aleksandr Aleksandrovich; MAKAROV, V.I., red.; CHERNOVA,  
M.S., red.

[Handbook for a steel fixer] Pamiatka armaturshchika. Pod  
obshchei red. V.I.Makarova. Leningrad, Lenizdat, 1963. 95 p.  
(MIRA 17:7)

STARIKOV, Aleksey Nikanorovich; MAKAROV, V.I., kand. tekhn. nauk,  
nauchnyy red.; LEPIN, A.E., red.; TIKHONOVA, I.M., tekhn.  
red.

[Reference book for the joiner and cabinetmaker] Spravochnaia  
kniga stoliara-stroitelia i mebel'shchika. Leningrad, Len-  
izdat, 1963. 414 p. (MIRA 16:5)  
(Carpentry--Handbooks, manuals, etc.)

MAKAROV, V.; ZHIZHIN, V.

Combination road machine. Avt.dor. 24 no.5:23 My '61.  
(MIRA 14:6)  
(Road machinery)

MAKAROV, Vladimir Ivanovich; PCHELKIN, Yu.V., red.; PRESNOVA, V.A.,  
tekhn. red.

[Handbook for the plasterer] Pamiatka shtukatura. Leningrad,  
Lenizdat, 1961. 61 p. (MIRA 15:1)  
(Plastering--Handbooks, manuals, etc.)

MAKAROV, Vladimir Ivanovich, kand. tekhn. nauk, dotsent; SMIRNOV,  
N.A., prof., red.; FREGER, D.P., red.izd-va; GVITS, V.L.,  
tekhn. red.

[Overall mechanization and automation at concrete and  
mortar plants] Kompleksnaia mekhanizatsiia i avtomatizatsiia  
na zovodakh betonov i rastvorov. Pod obshchei red. N.A.  
Smirnova. Leningrad, Leningr. dom nauchno-tekhn. propagandy,  
1961. 43 p. (Bibliotekha stroitel'ia po mekhanizatsii i  
avtomatizatsii stroitel'stva, no.2) (MIRA 15:8)  
(Concrete plants) (Mortar) (Automation)



MAKAROV, Vladimir Ivanovich, dotsent, kand.tekhn.nauk; GRAVE, I.P.,  
dotsent, kand.tekhn.nauk, nauchnyy red.; MEYTUS, M.E.,  
red.izd-va; VORONETSKAYA, L.V., tekhn.red.

[Rail transportation in the construction industry] Rel'sovy1  
transport na stroitel'stve. Leningrad, Gos.izd-vo lit-ry po  
stroit., arkhit. i stroit.materialam, 1960. 195 p.

(MIRA 14:2)

(Railroads, Industrial) (Cableways)  
(Building materials--Transportation)

15-57-10-14328  
Translation from: Referativnyy zhurnal, Geologiya, 1957, Nr 10,  
pp 157-158 (USSR)

AUTHORS: Makarov, V. I., Sokolov, V. P.

TITLE: The Prospects for Developing Crushed Stone Industry  
(Perspektivy razvitiya predpriyatiy po proizvodstvu  
shchebnya)

PERIODICAL: V sb.: 15-ya nauch. konferentsiya Leningr. inzh.-stroit.  
in-ta, Leningrad, 1957, pp 339-342

ABSTRACT: The industrial development of nonmetallic materials  
should be made a large-scale regional enterprise, lead-  
ing to the manufacture of a vast assortment of stone  
products. none given

Card 1/1

MAKAROV, Vladimir Ivanovich, SPIVAKOV, Mikhail Semenovich, LEPIN, A.E. red.;  
SMIRNOV, P.S., tekhn.red.

[Operation of equipment used for installation work and transportation  
in apartment house construction]. Eksploatatsia montazhno-transportnogo  
oborudovaniia v zhilishchnom stroitel'stve. [Leningrad] Lenizdat, 1957.  
209 p. (MIRA 11:9)

(Building machinery)